CLAIMS

We claim:

1. A unitary sensor for detecting biopotential signals on the skin of a patient, the sensor comprising:

a base strip including at least three electrodes spaced along the length of the base strip, each of the sensors being operable to detect biopotential signals on the skin of the patient; and

an extension strip integrally formed with the base strip and extending from the base strip to a distal end, the extension strip including an acoustic emitter attached to the distal end.

2. The unitary sensor of claim 1 wherein the base strip is configured to be attached to the forehead of the patient and the extension strip extends from the base strip such that the acoustic emitter is positionable in an ear of the patient when the base strip is positioned on the forehead of the patient.

3. The unitary sensor of claim 2 wherein the acoustic emitter is surrounded by a resilient plug such that the plug can be placed within the ear of the patient.

4. The unitary sensor of claim 1 wherein each of the plurality of sensors is operable to detect both EEG signals and AEP signals.

5. The unitary sensor of claim 1 wherein the base strip includes an adhesive to secure the base strip to the patient.

6. The unitary sensor of claim 1 further comprising a connector portion coupled to both the base strip and the extension strip, the connector portion

receiving a lead from each of the plurality of sensors and a pair of leads from the acoustic emitter.

7. The unitary sensor of claim 1 wherein the acoustic emitter is operable to emit an audible stimulus.

8. A system for monitoring the level of brain function in a patient from full awareness to deep drug-induced sleep, the system comprising:

a control unit coupled to a display for displaying the level of brain function;

a unitary sensor positionable on the patient and coupled to the control unit, the sensor including at least three electrodes to detect biopotential signals on the skin of the patient and an acoustic emitter operable to deliver an acoustic stimulus to the patient;

a passive measurement module coupled to the control unit and operable to receive the biopotential signals from the unitary sensor and determine the level of brain function; and

an active measurement module coupled to the control unit and operable to activate the acoustic emitter to deliver acoustic stimuli and receive the biopotential signals from the unitary sensor to determine the level of brain function.

9. The system of claim 8 wherein the passive measurement module is operable to determine the level of brain function from full awareness to deep drug-induced sleep.

10. The system of claim 8 wherein the active measurement module is operable to determine the level of brain function from full awareness to unconsciousness.

11. The system of claim 9 wherein the passive measurement module receives an EEG signal from the electrodes.

12. The system of claim 8 wherein the control unit is operable to select between the active measurement module and the passive measurement such that the control unit displays the current level of brain function from only one of the active measurement module and the passive measurement module at any given time.

13. The system of claim 12 wherein the control unit selects between the active measurement module and the passive measurement module based on a single threshold value.

14. The system of claim 8 wherein the unitary sensor includes a base strip and an extension strip, wherein the base strip is configured to be positionable on a forehead of the patient and the extension strip extends away from the base strip such that the acoustic emitter is positionable in an ear of the patient when the base strip is positioned on the forehead of the patient.

15. The system of claim 14 wherein the acoustic emitter is surrounded by a resilient plug.

16. The system of claim 15 wherein the resilient plug is configured to be received within the ear of a patient.

17. A system for monitoring the level of brain function in a patient from full awareness to deep drug-induced sleep, the system comprising:

a control unit coupled to a display for displaying the level of brain function;

a sensor positionable on the patient and coupled to the control unit, the sensor including at least three electrodes to detect biopotential signals on the skin of the patient;

an acoustic emitter operable to deliver an acoustic stimulus to the patient;

a passive measurement module coupled to the control unit and operable to receive the biopotential signals from the sensor and determine the level of brain function; and

an active measurement module coupled to the control unit and operable to activate the acoustic emitter to deliver acoustic stimuli and receive the biopotential signals from the sensor to determine the level of brain function,

wherein the control unit is operable to select between the active measurement module and the passive measurement such that the control unit displays the current level of brain function from only one of the active measurement module and the passive measurement module at any given time.

18. The system of claim 17 wherein the passive measurement module is operable to determine the level of brain function from full awareness to deep drug-induced sleep.

19. The system of claim 17 wherein the active measurement module is operable to determine the level of brain function from full awareness to unconsciousness.

20. The system of claim 17 wherein the control unit selects between the active measurement module and the passive measurement module based on a single threshold value.

21. A method for monitoring the depth of sedation in a patient from full awareness to deep drug-induced sleep characterized by the suppression of EEG, the method comprising the steps of:

providing a passive measurement module operable to determine depth of sedation from full awareness to deep drug-induced sleep;

providing an active measurement module operable to determine depth of sedation from full awareness to the level of losing consciousness; and

means for combining the information from the active measurement module and the passive measurement module to obtain the best accuracy over the entire range of sedation.

22. The method of claim 21 wherein the passive measurement module determines the depth of sedation based on the analysis of an EEG signal from the patient.

23. The method of claim 21 wherein the active measurement module determines the depth of sedation based upon the analysis of the response of the patient's brain to an auditory stimuli.

24. The method of claim 21 further comprising the step of positioning a unitary sensor on the patient, the unitary sensor being operable to detect the biopotential signals from the patient and deliver an auditory stimuli to the patient.

25. The method of claim 21 wherein the means for combining the information from the active measurement module and the passive measurement module includes a control unit coupled to both the active measurement module and the passive measurement module.

26. The method of claim 25 wherein the control unit selects between the display of the depth of sedation from the passive measurement module and the active measurement module based upon a threshold value.

27. The method of claim 21 wherein the means for combining the information from the active measurement module and the passive measurement module displays only a single depth of sedation based upon a selection between the passive measurement module and the active measurement module.

28. The method of claim 24 wherein the unitary sensor includes a base strip including at least three electrodes to detect biopotential signals on the skin of the patient and an extension strip including an acoustic emitter operable to deliver the auditory stimuli to the patient.